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EXPOSURES

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SIK

THE

ESTIMATION OF EXPOSURES,

OR

EXTERNAL HAZARDS,

IN

FIRE INSURANCE.

WITH SCHEDULES AND FORMULAS FOR RATING RISKS, AND STENOGRAPHIC FORMULAS FOR DENOTING RISKS AND RATES.

BY WILLIAM FRAZIER ROSS.

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PREFACE.

It is a fact generally understood, that a person who does not understand the first principles of fire insurance, may "accept an agency," and gradually acquire some knowledge of the business, without any effort or study, and without any expense to himself. That last clause should be modified: A fire insurance agent who does not understand his business is more apt to make large commissions. But if an agent would be able to rate a risk twice alike, he must read and study some. To understand and use the tables and formulas in the following pages, requires some reading and some study.

W. F. R.

DAVENPORT, IOWA, June, 1874.

INTRODUCTION.

1. Either in selecting risks or in making rates of premium, the various combinations of hazards which occur in the business of insurance must be computed in some way. The estimation of external hazards has always been one of the greatest difficulties in intelligent fire underwriting. We have no statistics on which to base any calculations of exposures. Whatever statistics underwriters may have compiled from their own experience, they hold them at a premium, and make no exposure of them, unless it is in their published rates, which include only simple hazards and a few of the simplest combinations.

2. The difference in the rates of simple and compound hazards does not necessarily indicate the increase of risk from *external exposure* to one or more of the same hazards. The moral element in a risk is materially affected by association and combination: The inherent hazard of one of several occupancies in the same building, even when the building is proportionably larger, is not considered so great as that of the same occupancy in a separate building. Several

branches of business under the same management in a single building, or in several adjacent buildings, are not considered so hazardous as when each is owned and managed separately. A dwelling in connection with a mercantile or manufacturing risk does not usually increase the rate — the protection afforded by the household gods in a dwelling, seems to offset a measure of moral hazard in the store or factory equal to the risk of accidents in the dwelling.

3. The experience of fire insurance companies must be looked to, as far as practicable, for rates — "An ounce of experience is worth a pound of theory." With proper classification, the hazards of exposure may be approximated by comparing proofs of loss with the original surveys or reports of the risks. The experience of all of the companies for a single year, however, would be more satisfactory than the life-long records of the oldest of them, for the character of hazards and buildings, and means for extinguishing fires, are constantly changing. But any method at present practicable for the estimation of exposures must be, to a great extent, based on general principles, and subject to continual improvement.

ELEMENTARY CONSIDERATIONS.

4. Danger of fire from exposures may be resolved into several elements, which do not always exist in the same proportions, and each of which is differently affected by attending circumstances.

5. Radiant heat is distributed impartially in all directions; and, as its rays spread, its fervency rapidly diminishes with distance. Air currents may increase its fervency, but do not affect its impartial distribution.

6. Flames naturally tend upwards, seizing upon wooden cornices and like vanities, and, unless driven downwards by overpowering winds, do not directly ignite objects below them. The supply of air is rarely sufficient to consume at once all of the inflammable gases set free by large fires, and so flames sometimes reach great distances, and gases escape, which, in extensive conflagrations, may be driven to the front and there take fire.

7. Sparks and fire-brands also have high aims. Shingle roofs are their specialty, and those of tall buildings, difficult of access, seem to be peculiarly susceptible to them; but they also freely descend to the most obscure quarters, and may be carried by the winds to great distances, and inflame other local-

ities after the fire from which they have originated is subdued and all apprehensions of danger are allayed.

8. The danger from flames and from sparks and fire-brands, depends on the force and direction of the wind at the time of the fire, which may be more or less modified by surrounding objects and the air currents which the heat produces. Either in selecting risks or fixing rates, allowance should be made for the prevailing winds of the locality and the probabilities whether the general direction of the air currents will be from the burning object towards the subject of insurance, or not.

9. Danger from conduction, by contact of combustible materials, is independent of air currents. It follows continuous wooden cornices and porches, and shingle and asphaltic roofs, and penetrates where timbers pass through brick walls; but the progress of fire by conduction *alone*, in ordinary building materials, is generally slow, and, when accelerated by concurrent winds, it is surpassed by flames — so that, where the facilities for extinguishing fires are good, the danger from conduction does not call for separate consideration.

10. Burning liquids crawl to the lowest levels, unaffected by wind or water, and undermining all ordinary protections against fire. Exposure to oils or spirits stored in large quantities, *so located that they would flow towards the risk*, may be so great as to neutralize all protections and drown all other considerations.

BASIS RATE.

11. The *measure of hazard* from an exposure, depends on the *measure of protection* therefrom; but the *value of the protection* depends on the *danger in the exposure;* and *the proper basis* for the estimation of any exposure must be found *in the object of danger.*

12. The rate of premium on any object should *contain* the basis for estimating the hazard of exposure thereto; but a rate of premium does not necessarily indicate the chances of destruction by fire. A proper rate of premium is understood to be that proportion of the sum insured on a certain class of risks which is required to settle the claims for losses thereon, the expenses of insurance, etc. We may safely accept the classification of the companies whose business it is to adapt their rates to their risks, and who look to the profits for guidance; and whatever classification may be made for obtaining rates of premium, we may with propriety use the same classification for exposures; but a rate of premium embraces hazards which do not attach to a rate of exposure:

13. It would seem unnecessary to say that a rate of exposure should not include the reciprocal hazard of exposure to the subject of insurance, but in the

classification of risks more attention is given to the character of the property on which the losses occur than to the origin of fires, and so each class of risks is charged with its losses, whether they result from inside or outside causes; and so rates of premium on other than so-called "detached" property include outside hazards, which should be deducted from all basis rates when exposures are calculated.

14. A large proportion of claims paid is for "partial loss" and "damage" from fires suppressed on the premises. The portion of a rate of premium which covers such "losses" should not be included in a rate of exposure, any more than the cost of the fuel used in buildings should be included in estimating rates of premium; and if we take the underwriters' rate of premium from which to obtain a basis for estimating exposure, the hazards of "partial loss" and "damage," must be eliminated from the calculation. The proportion of these hazards is greater in brick or stone buildings than it is in wooden ones, and is greater in the larger cities, where the buildings are constructed more carefully, with reference to the prevention of fires, where they are more elaborately finished, and consequently more easily damaged, and where the fire departments are better organized and more experienced — for while rates of premium are reduced by facilities for extinguishing fires, they are more burdened with the hazards of "partial loss" and "damage." The proportion of partial losses should be less in the more combustible risks, and those in which

there is more "moral hazard," for combustibility and "moral hazard" both tend to destruction; and, generally, the circumstances which reduce rates of premium should reduce rates of exposure more, and *vice versa.*

15. In the absence of any means for extinguishing fires, the basis rate of premium and the basis rate of exposure should be the same, and the rate of exposure at any distance within which ignition would occur by radiant heat, should equal the basis rate. Thus, the rate of premium on any building in a frame range, or in a block of brick or stone buildings communicating, would be the same as that for a blanket policy on the entire range or block, and would equal the sum of their hazards.

16. But any insurable property may be assumed to have some conveniences — such as buckets, and wells or cisterns of water, at least — which can be used to extinguish accidental fires. The value of such conveniences is more or less affected by the occupation and combustibility of the premises.

17. In the following tables and examples, the degree of hazard is indicated by Italic capital letters — *A* representing non-hazardous occupancy, *B* and *C* hazardous and more hazardous, and *D* most hazardous: —

RATIOS OF BASIS RATES OF EXPOSURE TO INHERENT HAZARDS OF FRAME BUILDINGS.

FIRE DEPARTMENT.	*A.*	*B.*	*C.*	*D.*
First class	.35	.45	.55	.65
Second class	.40	.50	.60	.70
Third class	.45	.55	.65	.75
Fourth class	.50	.60	.70	.80
Fifth class	.55	.65	.75	.85
Sixth class	.60	.70	.80	.90

RATIOS OF BASIS RATES OF EXPOSURE TO INHERENT HAZARDS OF BRICK BUILDINGS.

FIRE DEPARTMENT.	*A.*	*B.*	*C.*	*D.*
First class	.25	.35	.45	.55
Second class	.30	.40	.50	.60
Third class	.35	.45	.55	.65
Fourth class	.40	.50	.60	.70
Fifth class	.45	.55	.65	.75
Sixth class	.50	.60	.70	.80

MEANS FOR EXTINGUISHING FIRES.

18. People are more self-reliant and more prompt in the use of buckets of water and wet blankets where there are no firemen or engines to depend upon. Buckets filled with salt water, kept expressly for extinguishing accidental fires, Babcock extinguishers, and the like, *in a building*, are frequently of more value than an engine and hose, and a volunteer fire company — to be alarmed, to assemble, to find the fire, to take water, and to be waited for while the fire is progressing. In villages, where the buildings are generally low and easily accessible, bucket and ladder companies, consisting of property owners, officered by "natural selection," each member keeping his own bucket where he can take and use it without delay, are generally more prompt and efficient than more pretentious organizations.

19. Engines and hose are useful for reaching parts of buildings otherwise inaccessible, and for preventing the further spread of fires, when beyond the control of simpler means. A hand engine, carefully manned, and with sufficient hose well preserved, added to the handier appliances named, should still further reduce rates of exposure; but in

villages, where accidental fires seldom occur, where firemen have few legitimate opportunities for practice, where hose is not properly cared for, and where the supply of water is uncertain, volunteer fire companies with engines are frequently worse than useless.

20. A well-organized hook and ladder company, under competent authority, is also calculated to intercept large fires, especially in frame ranges, and is frequently the means of saving furniture and stocks which would otherwise be consumed with the buildings. From the fact that such organizations are useful in saving portable property, and that they destroy buildings to prevent the spread of fires, they should reduce the rates of exposure on stocks easily moved, rather than on buildings which they may be called upon to demolish.

21. The Holly system of water works, in which the water is supplied to mains directly by powerful stationary engines, with hydrants for the attachment of hose at each street crossing, may be ranked among the best *facilities* for extinguishing fires; but, with all its acknowledged advantages, is liable to be rendered useless at any moment by the bursting of a main — an accident most liable to occur under "fire pressure," and nearest to the common source of supply. Such facilities should not take the place of separate public cisterns and wheeled engines, any of which may be used independently. Any system of pipes and hydrants, all connected and all supplied from the same source, may be said to be a slender

dependence for the suppression of fires, especially in times of "insurrection, riot, or civil commotion."

22. Steam fire engines, well manned and equipped, with ample supplies of water convenient, are more reliable for the suppression of large conflagrations. They should, therefore, materially reduce rates of exposure, though they do not usually lessen the basis rates of premium, except in "paid departments," and, like the Holly system, rather tend to increase the proportionate rates of premium on stocks.

23. The Babcock "engines" and "extinguishers" use but little water, comparatively, but the limited supply required by them should be no less sure and convenient.

24. It is evident that the efficiency of a fire department may be seriously impaired through lack of consistency in its appointments. Trained horses, ready to take their places and start with a steamer or hose cart at a moment's warning, would be of little advantage without a fire alarm telegraph to indicate the locality of the fire. Neither is there any advantage in superior machinery without corresponding ability to manage it. It is only in the most populous cities, where fires are frequent, that we may expect to find the best appointments coupled with the most thorough experience.

25. A classification of fire departments in accordance with their arrangements for extinguishing fires, seems more satisfactory than a classification by pop-

ulation, although, as a rule, the greater the population, the better are the fire organizations. Such a classification would probably be something like the following: —

CLASSIFICATION OF FIRE DEPARTMENTS.

First class. — Public water works, with hydrants and capacious cisterns at each street crossing, or equally convenient natural supply of water; fire alarm telegraph; steamers; Babcock engines and extinguishers; hook and ladder trucks; fire patrol; men and horses constantly on duty.

Second class. — Similar to first class, but depending on hydrants instead of cisterns.

Third class. — Holly system of water works; fire alarm telegraph; hook and ladder trucks; hose carts; men and horses constantly on duty.

Fourth class. — Volunteer department, with Holly system or steamers, without telegraph.

Fifth class. — Volunteer department, with hand engines, or with hook and ladder and bucket trucks.

Sixth class. — No organization.

SPECIAL PROTECTIONS.

26. The thickness required in a standard fire wall should vary with the height and construction of the building. For a three-story building, a twelve-inch wall may be sufficient; for a four-story building, it may be sufficient for the first story to be sixteen inches and the others twelve; for a five-story building, the first story should be twenty inches.

27. The absence of beveled beams and joists or ledges *on the inside of a wall*, does not impair its value as a protection from external exposure; but when timbers enter walls so that, in the event of their burning, they would be liable, in falling, to overturn the wall, the value of the latter as a protection to property *on the other side of it* is seriously impaired.

28. Openings in side walls should be covered on both sides with extra heavy iron doors. Shutters, sufficiently thick for front and rear windows, are comparatively worthless in partition walls, where they may be directly subjected to intense heat.

29. The value of any partial protection depends on the character of the hazard, on the other partial protections which accompany it, and on the conveniences and facilities for extinguishing fires. The

various combinations of protections are infinite, but are susceptible of classification sufficiently accurate for the present status of the science of fire insurance.

CLASSIFICATION OF PROTECTIONS.

SIDE WALLS, OR WALLS DIRECTLY EXPOSED.

A. Brick or stone (of standard thickness [26], when in a block), extending eighteen inches above the roof, coped with brick or stone, and without openings, or openings with heavy iron doors on both sides [28]. If supporting joists of adjoining building, the joists must be beveled or rest on ledges [27].

B. Similar to A, but extending only to the roof.

C. Brick or stone, with openings unprotected, or otherwise defective, or with wooden Mansard roof directly exposed.

D. Wood, or lath and plaster.

FRONT AND REAR WALLS.

A. Brick or stone, with heavy iron shutters over all openings: cornices of brick, stone, or metal.

B. Similar to A, without iron shutters over openings.

C. Brick or stone, with wooden cornice, or wooden Mansard roof.

D. Wood.

ROOF.

a. Tile or slate laid in cement, or metal.

b. Tile or slate not laid in cement.

c. Composition.

d. Shingles.

SPACE.

30. The measure of space required to avoid exposure depends on the nature and size of the object of danger, the nature and relative position of the subject of insurance, the special protections, and the conveniences for extinguishing fires.

31. A very little space cuts off one element of exposure (conduction), and affords a way for introducing extinguishers and interposing extemporary protections. But at any distance where ignition would probably occur from radiant heat, the whole of the basis rate of exposure should attach to the risk, subject only to such reductions as may be justified by special protections and the conveniences for extinguishing fires.

32. Outside of danger from radiant heat, the rate of exposure should *at once* be reduced in proportion to the probabilities of the air currents driving the fire away from the risk. In localities where there are no prevailing winds, the remainder of the rate may be measured by the angle included by lines crossing diagonally from the extremities of the exposed sides of the subject of insurance and the object of danger. This remainder may again be reduced

in proportion to the probabilities that the *force* of the wind will not be sufficient to drive the fire to the subject of insurance.

33. When the direction of the subject of insurance from the object of danger is in the course of the prevailing winds of the locality, the whole basis rate of exposure may attach to the risk at any distance where fire-brands would probably reach, subject only to special protections and conveniences for extinguishing fires.

34. Where ignition is not probable, *damage* may figure in the rate as a fraction of the basis rate of exposure, equal to the fraction which the amount of such probable damage would be of the sum insured.

35. The figures at the head of the columns in the following table, indicate the measure of intervening space [30], the unit of which is assumed to represent the limits of danger by radiant heat [5, 31, 32,] — from ordinary hazards, a space equal to the height of the object of danger; from extra hazards, half as much farther; and from special hazards, a space equal to twice the height of the same [30]. Thus, from a building 20 feet in height, when the occupation is hazardous or non-hazardous, "1" represents a space of 20 feet; when extra hazardous, 30 feet; and when specially hazardous, 40 feet.

RATIOS OF EXPOSURE HAZARDS TO BASIS RATES OF EXPOSURE [17], WHEN BUILDINGS ARE PROTECTED AS SHOWN [29].

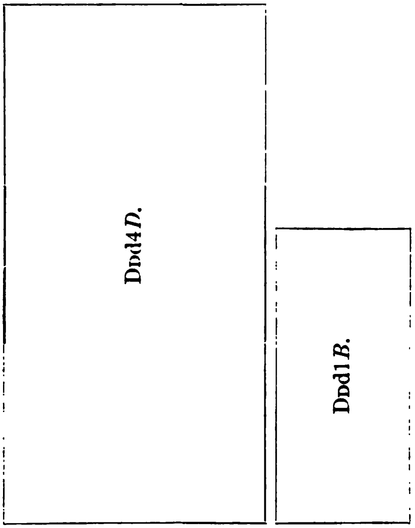
	0.	¼.	½.	¾.	1.	2.	3.
AAa	.1	...	...	...	...	...	...
AAb	.1	...	...	...	...	..	...
AAc	.1	...	...	...	...	...	...
AAd	.2	.1	.1	.1	.1	...	...
ABa	.2	.1	.1	...	...	...	...
ABb	.2	.1	.1	...	...	...	...
ABc	.2	.1	.1	...	...	...	...
ABd	.3	.2	.1	.1	.1	...	...
Aca	.3	.2	.1	.1	...	...	...
Acb	.3	.2	.1	.1	...	...	...
Acc	.3	2	.1	.1	..	...	..
Acd	.4	.3	.2	.1	.1	.1	...
ADa	.4	.3	.2	.1	.1	...	...
ADb	.4	.3	.2	.1	.1	...	..
ADc	.4	.3	.2	.1	.1	...	...
ADd	.5	.4	.3	.2	.1	.1	.1
BAa	.2	.1	.1	...	...	...	...
BAb	.2	.1	.1	...	...	...	...
BAc	.3	2	.1	.1	...	...	...
BAd	.4	.3	.2	.1	.1	.1	.1
BBa	.2	.1	.1	...	...	...	...
BBb	.2	.1	.1	...	...	...	...
BBc	.3	.2	.1	.1	...	...	...
BBd	.4	.3	.2	.1	.1	.1	.1
Bca	.3	.2	.1	.1	...	...	...
Bcb	.3	.2	.1	.1	...	...	..
Bcc	.4	.3	.2	.1	.1	...	...
Bcd	.5	.4	.3	.2	.1	.1	.1
BDa	.5	.4	.3	.2	.1	...	...
BDb	.5	.4	.3	.2	.1	...	...
BDc	.5	.4	.3	.2	.1	...	...
BDd	.6	.5	.4	.3	.2	.1	.1
CAa	.3	.2	.1	.1	...	...	...
CAb	.3	.2	.1	.1	...	...	...
CAc	.4	.3	.2	.1	.1	...	...
CAd	.5	.4	.3	.2	.1	.1	.1
CBa	.3	.2	.1	.1	...	...	...
CBb	.3	.2	.1	1	...	...	...
CBc	.4	.3	.2	.1	.1	...	...
CBd	.5	.4	.3	.2	.1	.1	.1
Cca	.4	.3	.2	.1	.1	...	...
Ccb	4	.3	.2	.1	.1	..	...
Ccc	.5	.4	3	.2	.1	.1	...
Ccd	.6	.5	.4	.3	.2	.1	.1
CDa	.6	.5	.4	.3	.2	.1	...
CDb	.6	.5	.4	.3	.2	.1	...
CDc	.6	.5	.4	.3	.2	.1	...
CDd	.7	.6	.5	.4	.3	.2	.1
DAa	.3	.2	.1	.1	...	...	...
DAb	4	.3	.2	.1	.1	...	...
DAc	.5	.4	.3	.2	.1	.1	...
DAd	.6	.5	.4	.3	.2	.1	.1
DBa	.3	.2	.1	.1	...	...	...
DBb	.4	.3	.2	.1	1	...	...
DBc	.5	4	.3	.2	.1	.1	...
DBd	.6	.5	.4	.3	.2	.1	.1
Dca	.4	.3	.2	.1	...	...	...
Dcb	.5	.4	.3	.2	.1	..	...
Dcc	.6	.5	.4	.3	.2	.1	...
Dcd	.7	.6	.5	.4	.3	.2	.1
DDa	1.	.8	.6	.4	.2	.1	...
DDb	1.	.8	.6	4	.2	.1	..
DDc	1.	.8	.6	.4	.2	.1	...
DDd	1.	.8	.6	.4	.3	.2	.1

EXAMPLE I.

NO ORGANIZED FIRE DEPARTMENT.

No. 1.—Frame building; shingle roof; four stories; special hazard, 7.00.

No. 2.—Frame building; shingle roof; one story; hazardous, 2.00.



To Rate No. 1.

Inherent hazard of No. 2, *B*..............................	2.00	
Basis rate, .70, [17]..	1.40	
Exposure, "Ddd," [35]......................................	1	1.40
Inherent hazard of No. 1, *D*..........		7.00
Rate on No. 1...		8.40

To Rate No. 2.

Inherent hazard of No. 1, *D*	7.00	
Basis rate, .90, [17]	6.30	
Exposure, "Dᴅd," [35]	1	6.30
Inherent hazard of No. 2, *B*		2.00
Rate on No. 2		8.30

◆

INTERVENING PROTECTIONS.

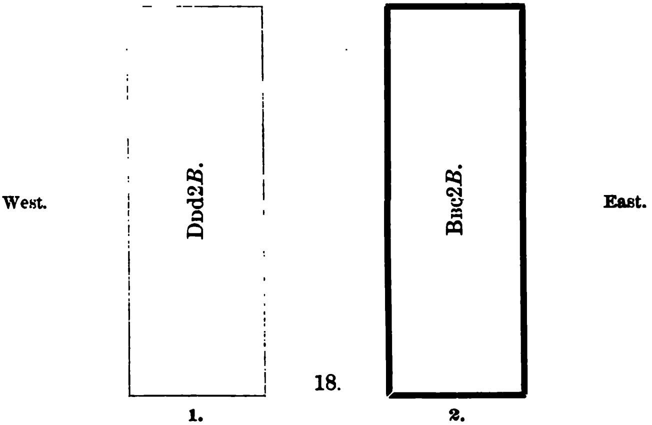
36. An intervening protection, whether it belongs to one or both of two buildings exposed to each other, may practically be considered as belonging to both. Thus, in finding the hazard of exposure of a D building to a C building, the former may be classed Cᴅd.

EXAMPLE II.

FIRE DEPARTMENT FIFTH CLASS.

No. 1.—Frame building; shingle roof; two stories—height, 24 feet; hazardous, 1.90.

No. 2.—Brick building; side walls entire to roof; windows unprotected in front and rear; composition roof; two stories—height, 24 feet; hazardous, 1.00.



To Rate No. 1.

Inherent hazard of No. 2, *B*	1.00	
Basis of exposure, .55, [17]	.55	
Exposure, "Bdd," "¾," [36]	.3	.16
Inherent hazard of No. 1, *B*		1.90
Rate on No. 1		2.06

To Rate No. 2.

Inherent hazard of No. 1, *B*	1.90	
Basis of exposure, .65, [17]	1.23	
Exposure, "Bbc," "¾," [35]	.1	.12
Inherent hazard of No. 2, *B*		1.00
Rate on No. 2		1.12

PREVAILING WINDS.

37. In localities where the winds prevail in a certain general direction, rates of exposure may be proportionably increased when the exposure is towards the source of the wind, and correspondingly reduced when the exposure is in the opposite direction — excepting in frame ranges, or when the hazard of exposure equals the basis rate, and excepting when it would reduce the rate of an immediate exposure of a brick building to less than one-tenth of the basis rate, or to a rate insufficient to cover the wall damage from fire and water. Thus, in the last example, if the winds prevail from the west in the ratio of two to one, the rate of exposure to No. 1 from No. 2 may be reduced one-third, making the exposure .11, and the rate of premium on No. 1, 2.01; and the hazard of exposure to No. 2 from No. 1 may be increased one-third, making the exposure .16, and the rate of premium on No. 2, 1.16.

EXAMPLE III.

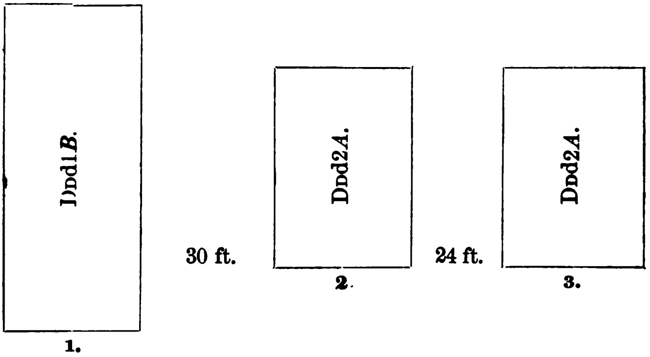
FIRE DEPARTMENT FOURTH CLASS.

Prevailing winds from west to east, two to one.

No. 1.—Frame building; shingle roof; one story, fifteen feet in height; hazardous, 1.80.

No. 2.—Frame dwelling; shingle roof; two stories, twenty-four feet in height; non-hazardous, .60; thirty feet east of No. 1.

No. 3.—Frame dwelling; shingle roof; two stories, twenty-four feet in height; non-hazardous, .60; twenty-four feet east of No. 2.



To Rate No. 2.

Inherent hazard of No. 1, *B*	1.80	
Basis of exposure, .60, [17]	1.08	
Exposure, "Ddd," "2,"	.2	.21
Add for western exposure $\frac{1}{3}$, [37]		.07
Inherent hazard of No. 3, *A*	.60	
Basis of exposure, .50, [17]	.30	
Exposure, "Ddd," "1," .3	.09	
Deduct for eastern exposure $\frac{1}{3}$, [37]	.03	.06
Inherent hazard of No. 2		.60
Rate on No. 2		.94

RELATIVE HEIGHT OF BUILDINGS.

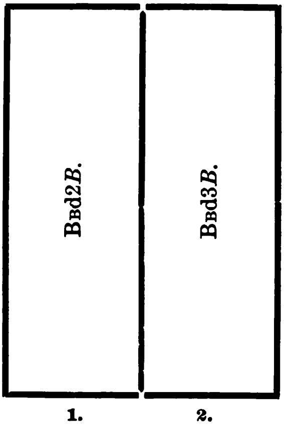
38. In estimating intervening protections, the relative height of the buildings should be considered: The same walls, by confining the burning gases within them, afford more protection to a lower than to a higher building [6]. Thus, two adjoining buildings, with a difference in height of one or more stories, each rating Bbd, would rate, relatively, the lower as Abd, and the higher as Bcd — the upper story of the latter, front and rear, being exposed to the roof of the former, while the intervening wall is an "A" protection to the lower building [36].

EXAMPLE IV.

FIRE DEPARTMENT FOURTH CLASS.

No. 1. — Brick building; side walls entire to roof; front and rear windows unprotected; shingle roof; *two stories;* hazardous, 1.05.

No. 2. — Brick building; construction same as No. 1; *three stories;* hazardous, 1.05.



To Rate No. 1.

Inherent hazard of No. 2, *B*	1.05	
Basis of exposure, .50, [17]	.52	
Exposure, "Abd," [38]	.3	.16
Inherent hazard of No. 1, *B*		1.05
Rate on No. 1		1.21

To Rate No. 2.

Inherent hazard of No. 1, *B*	1.05	
Basis of exposure, .50, [17]	.52	
Exposure, "Bcd," [38]	.5	.26
Inherent hazard of No. 2, *B*		1.05
Rate on No. 2		1 31

DOUBLE PROTECTIONS.

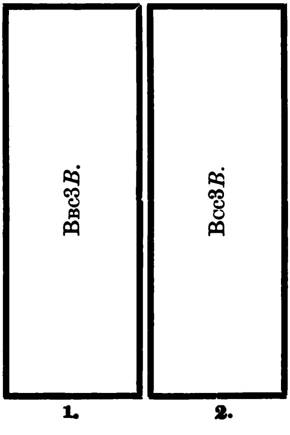
39. Two parallel walls adjoining are classed as one protection.

EXAMPLE V.

FIRE DEPARTMENT THIRD CLASS.

No. 1.—Brick building; side walls entire to roof; front and rear windows unprotected; brick cornice; composition roof; three stories; hazardous, .90.

No. 2.—Brick building; side walls entire to roof; front and rear windows unprotected; wooden cornice front and rear; composition roof; three stories; hazardous, 1.00.



To Rate No. 1.

Inherent hazard of No. 2, *B*	.90	
Basis of exposure, .45, [17]	.40	
Exposure, "Bbc," [39]	.3	.12
Inherent hazard of No. 1, *B*		.80
Rate on No. 1		.92

To Rate No. 2.

Inherent hazard of No. 1, *B*	.80	
Basis of exposure, .45, [17]	.36	
Exposure, "Bcc," [39]	.4	.14
Inherent hazard of No. 2, *B*		.90
Rate on No. 2		1.04

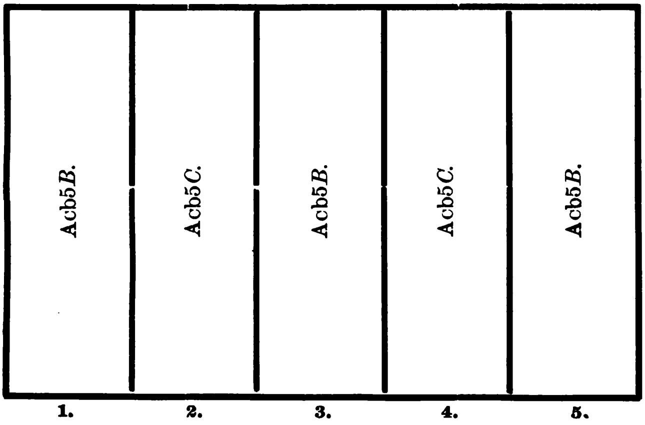
INDIRECT EXPOSURES.

40. An indirect exposure may be calculated from the hazard attaching to the intervening building, either with the basis rate of the latter or separately, and either in direct order or inversely.

EXAMPLE VI.

FIRE DEPARTMENT SECOND CLASS.

Block of five brick buildings; side walls of standard thickness, eighteen inches above roof; front walls surmounted by wooden cornice and Mansard slate roof; five stories; occupation of Nos. 1, 3, and 5 hazardous, .70; Nos. 2 and 4, extra hazardous, 1.00.



To Rate No. 3.

Inherent hazard of No. 5, *B*	.70	
Basis of exposure, .40, [17]	.28	
Exposure to No. 4 ("Acb,") .3	.08	
Exposure to No. 3 [40]	.3	.02
Inherent hazard of No. 4, *C*	1.00	
Basis of exposure, .50, [17]	.50	
Exposure	.3	.15
Inherent hazard of No. 2, *C*	1.00	
Basis of exposure, .50, [17]	.50	
Exposure	.3	.15
Inherent hazard of No. 1, *B*	.70	
Basis of exposure, .40, [17]	.28	
Exposure, .3 of .3, [40]	.09	.02
Total hazard of exposure to No. 3		.34
Inherent hazard of No. 3		.70
Rate on No. 3		1 04

41. When the protections and means for extinguishing fires are not sufficient to prevent a fire from extending to a third building in a block, or row, in which the buildings are all similarly protected, it is probable that the fire, with its increasing fervency, will extend to all of the other buildings in the same direction. So, in the calculation of indirect exposures, only two intervening protections are considered. Thus, using the last example —

To Rate No. 2.

Inherent hazard of No. 3, *B*	.70	
Basis of exposure, .40, [17]	.28	
Exposure	.3	.08
Inherent hazard of No. 4, *C*	1.00	
Basis of exposure, .50, [17]	.50	
Exposure, .3 of .3, [40]	.09	.04

Inherent hazard of No. 5, *B*	.70	
Basis of exposure, .40, [17]	.28	
Exposure, .3 of .3, [41]	.09	.03
Inherent hazard of No. 1, *B*	.70	
Basis of exposure, .40, [17]	.28	
Exposure	.3	.08
Total hazard of exposure to No. 2		.23
Inherent hazard of No. 2		1.00
Rate on No. 2		1.23

To Rate No. 1.

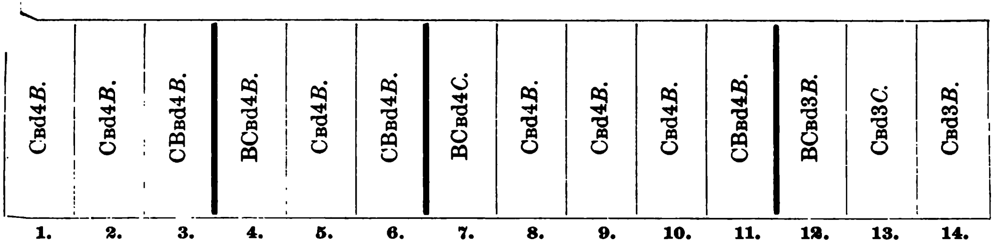
Inherent hazard of No. 2, *C*	1.00	
Basis of exposure, .50, [17]	.50	
Exposure	.3	.15
Inherent hazard of Nos. 3 and 5, *B*, [40]	1.40	
Basis of exposure .40, [17]	.56	
Exposure, .3 of .3, [41]	.09	.05
Inherent hazard of No. 4, *C*	1.00	
Basis of exposure, .50, [17]	.50	
Exposure, .3 of .3, [41]	.09	.04
Total hazard of exposure to No. 1		.24
Inherent hazard of No. 1		.70
Rate on No. 1		.94

42. When the intervening protections are not alike, the two best should be used in estimating the hazard of exposure.

43. When the side walls of a building are not alike, both should be represented. See Nos. 3, 4, 6, 7, 11, and 12, in the following example.

EXAMPLE VII.

FIRE DEPARTMENT FOURTH CLASS.



To Rate No. 1.

Inherent hazard of No. 2, *B*............	1.20	
Basis of exposure, .50, [17]..............	.60	
Exposure, "CBd," [35].....................	.5	.30
Inherent hazard of No. 3, *B*............	1.20	
Basis of exposure, .50, [17]..............	.60	
Exposure, .5 of 5, [40].....................	.25	.15
Inherent hazard of No. 4, *B*............	1.20	
Basis of exposure, .50, [17]..............	.60	
Exposure, BBd, CBd, 5. of .4, [42]...	.20	.12
Exposure Nos. 5 and 6, same.........		.24
Inherent hazard of No. 7, *C*............	2.40	
Basis of exposure, .60, [17]..............	1.44	
Exposure, BBd, BBd, .4 of .4, [42]...	.16	.23
Exposure No. 13, the same [41,42]...		.23
Inherent hazard of No. 8, *B*............	1.20	
Basis of exposure, .50, [17]..............	.60	
Exposure, .4 of .4 [42]......................	.16	.10
Exposure Nos. 9, 10, 11, 12, 14, same, [41,42]		.50
Total hazard of exposure to No. 1.........		1.87
Inherent hazard of No. 1......................		1.20
Rate on No. 1....................................		3.07

44. When space intervenes in an indirect exposure, the object of danger and the intervening buildings severally determine the unit of measure for transferring the hazard therefrom [35].

EXAMPLE VIII.

FIRE DEPARTMENT FIFTH CLASS.

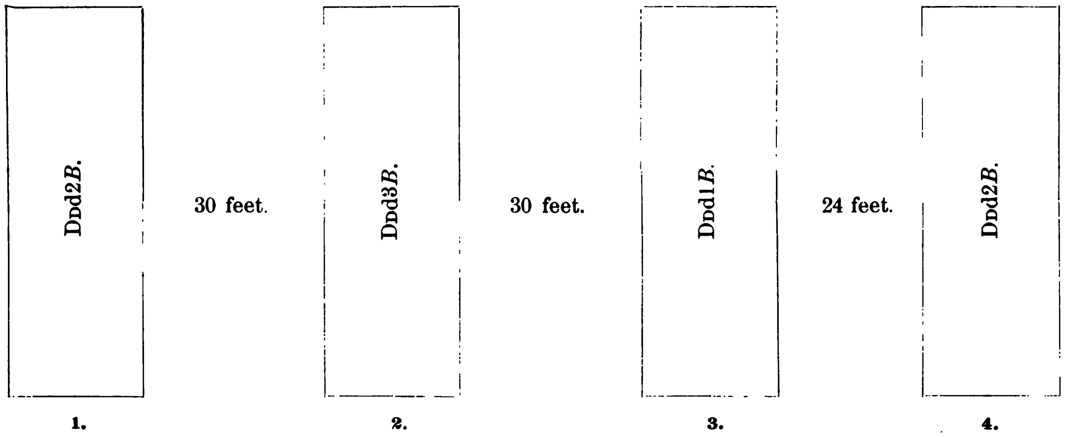
Prevailing winds from southwest, west, and northwest.

No. 1. — Frame building; shingle roof; two stories; hazardous, 1.90; twenty-four feet in height.

No. 2. — Frame building; shingle roof; three stories; hazardous, 1.90; thirty feet in height; thirty feet south of No. 1.

No. 3. — Frame building; shingle roof; one story; hazardous, 1.90; fifteen feet in height; thirty feet south of No. 2.

No. 4. — Frame building; shingle roof; two stories; hazardous, 1.90; twenty-four feet in height; twenty-four feet south of No. 3.


Dᴅd2B.
1.
30 feet.
Dᴅd3B.
2.
30 feet.
Dᴅd1B.
3.
24 feet.
Dᴅd2B.
4.

To Rate No. 1.

Inherent hazard of No. 2, *B*	1.90	
Basis of exposure hazard, .65, [17]	1.23	
Hazard to No. 1, "DDd," "1," [35, 44]	.3	.37
Inherent hazard of No. 3, *B*	1.90	
Basis of exposure hazard, .65, [17]	1.23	
Hazard to No. 2, "DDd," "2," [35, 44,] .2	.25	
Hazard to No. 1, "DDd," "1," [35, 44,]	.3	.07
Inherent hazard of No. 4, *B*	1.90	
Basis of exposure hazard, .65, [17]	1.23	
Hazard to No. 3, "DDd," "1," [35, 44,] .3	.37	
Hazard to No. 2, "DDd," "2," [35, 44,] .2	.07	
Hazard to No. 1, the same, [41, 42]		.07
Inherent hazard of No. 1		1.90
Rate on No. 1		2.36

To Rate No. 4.

Inherent hazard of No. 3, *B*	1.90	
Basis of exposure hazard, .65, [17]	1.23	
Hazard to No. 4, "DDd," "2," [35, 44]	.2	.25
Inherent hazard of No. 2, *B*	1.90	
Basis of exposure hazard, .65, [17]	1.23	
Hazard to No. 3, "DDd," "1," [35, 44,] .3	.37	
Hazard to No. 4, "DDd," "2,"	.2	.07
Inherent hazard of No. 1, *B*	1.90	
Basis of exposure hazard, .65, [17]	1.23	
Hazard to No. 2, "DDd," "1," [35, 44,] .3	.37	
Hazard to No. 3, "DDd," "1," [35, 44,] .3	.11	
Hazard to No. 4, "DDd," "2," [35, 44,] .2 of .37 [41, 42]		.07
Inherent hazard of No. 4		1.90
Rate on No. 4		2.29

CONTENTS OF BUILDINGS.

45. Buildings and their contents are not subject to alike hazard from the same exposure.

46. In cities where the fire departments are efficient, the contents of buildings adjacent to fires are not usually disturbed, and may remain unharmed, though the buildings be damaged.

47. In villages, where but little reliance is placed upon the means for extinguishing fires, it frequently happens, when fires occur in ranges or rows, that exposed buildings are burned and their entire contents safely removed.

48. Where the fire department is not often tried, contents of buildings are liable to unnecessary damage by too much haste in moving them. This liability offsets some of the advantages in favor of " stocks easily moved," and especially when the exposure is remote or indirect.

49. As policies are now written, to cover all loss and damage by fire, not exceeding the sum insured, regardless of the value of the property, also to contribute proportionably to damage by removal, *when necessary*, losses on personal property are peculiarly liable to be aggravated, through lack of a well-

defined purpose on the part of the owner in preserving imperiled goods, when they are insured.

50. In the following examples, the character of the contents of buildings with regard to their liability to injury and destruction in case of fire, is indicated by small Italic letters: *a* denoting first class, or preferred stocks; *b*, second class; *c*, third class; and *d*, fourth class, or goods most liable to destruction by burning of the premises. The floors on which the goods are located are indicated by the figures immediately following. Thus, *a* 1 2, denotes preferred stock in first and second stories, or in first story and cellar; *c* 1, *d* 2 3, denotes third class goods on first floor and fourth class goods in second and third stories. The absence of figures after the letters indicates that the goods occupy the entire building.

51. Without presuming to name the goods belonging to the several classes indicated, it is safe to assume that where the fire departments are fourth, fifth, or sixth class, the hazard from external exposures to certain preferred stocks located on the ground floor is thirty per cent less than the hazard from the same exposure to the building containing them. So, for rates on stocks where the fire departments are fourth, fifth, or sixth class, the following deductions are made from the hazard of exposure to the building:—

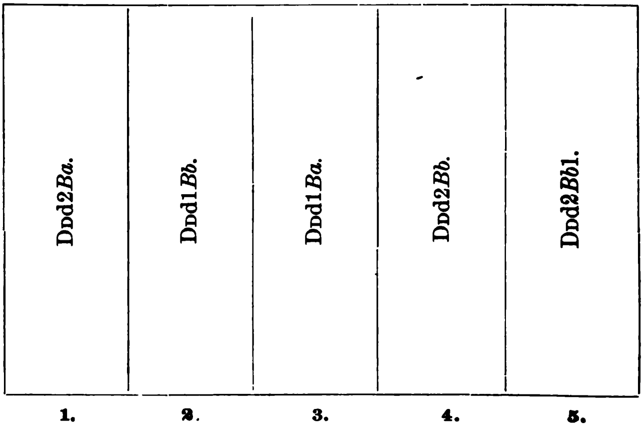
Class *a* — 30 per cent.
Class *b* — 20 per cent.
Class *c* — 10 per cent.
Class *d* — no deduction.

For exposure hazard to goods above or below the first floor, ten per cent less is deducted for each floor above or below the first, or the average of the floors occupied. Thus, for goods of class *b* in first, second, and third stories, ten per cent is deducted from the hazard of exposure to the building.

EXAMPLE IX.

FIRE DEPARTMENT FIFTH CLASS.

Frame range; shingle roofs; one and two stories; occupation hazardous, 1.90.



To Rate the Buildings.

Inherent hazard of each..		1.90
Basis of exposure, .60..	1.14	
Exposure to four buildings, 1. each....................	4	4.56
Rate on the buildings..		6.46

To Rate the Stock in No. 1.

Exposure to building	4.56	
Exposure to stock, class *a* 1 2	.75	3.42
Inherent hazard, No. 1		1.90
Rate on stock, *a* 1 2, in No. 1		5.32

To Rate the Stock in No. 2.

Exposure to building	4.56	
Exposure to stock, class *b* 1	.80	3.65
Inherent hazard		1.90
Rate on stock, *b* 1, in No. 2		5.55

To Rate the Stock in No. 3.

Exposure to building	4.56	
Exposure to stock, class *a* 1	.70	3.19
Inherent hazard		1.90
Rate on stock, *a* 1, in No. 3		5.09

To Rate the Stock in No. 4.

Exposure to building	4.56	
Exposure to stock, class *b* 1 2	.85	3.87
Inherent hazard		1.90
Rate on stock, *b* 1 2, in No. 4		5.77

To Rate the Stock in No. 5.

Exposure to building	4.56	
Exposure to stock, class *b* 1	.80	3.65
Inherent hazard		1.90
Rate on stock, *b* 1, in No. 5		5.55

DIRECT AND INDIRECT EXPOSURES.

52. When a building is exposed both directly and indirectly, the greater hazard alone is considered.

53. B walls directly exposed are classed as C.

54. When an exposure is diagonal, the rate of exposure should be reduced according to the angle of incidence. Thus, when the angle of incidence is forty-five degrees, the rate of exposure should be reduced one-fourth: when sixty degrees, one-third; when ninety degrees, one-half.

EXAMPLE X.

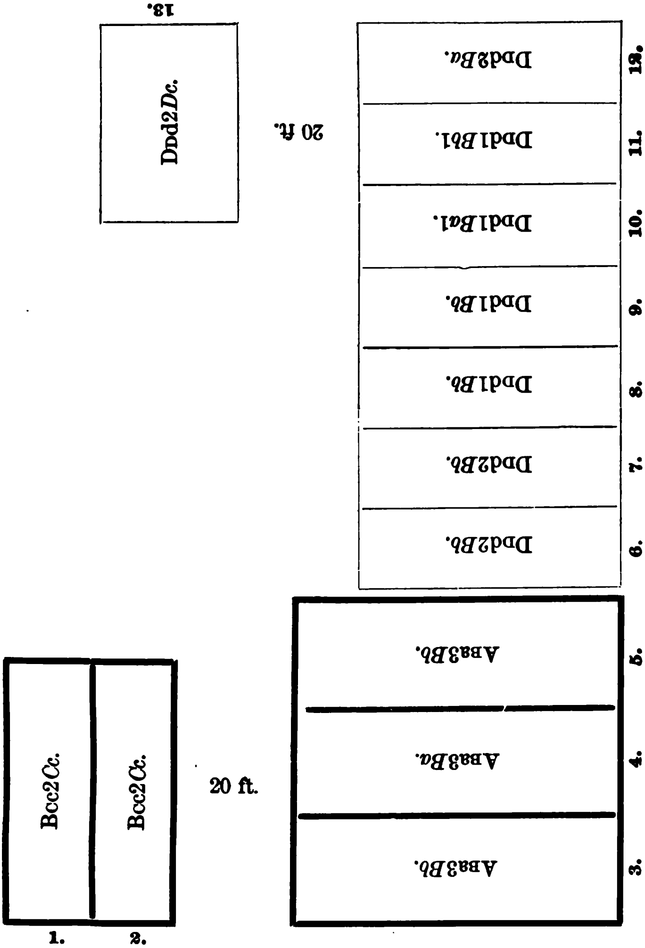
FIRE DEPARTMENT FOURTH CLASS.

Nos. 1 *and* 2.—Brick buildings; composition roof; two stories; extra hazardous, 2.70.

Nos. 3, 4, *and* 5.—Brick block; standard side walls; windows in front and rear unprotected; tin roof; three stories; occupation hazardous, .70.

Nos. 6 *to* 12, *inclusive.*—Frame range; occupation hazardous, 1.80.

No. 13.—Frame building; shingle roof; two stories; occupation specially hazardous, 5.00.



Height of Nos. 1 and 2, twenty-four feet; unit of measure for exposure thereto, thirty-six feet.

Height of No. 13, twenty feet; unit of measure for exposure thereto, forty feet.

To Rate Nos. 6 to 12.

Inherent hazard of Nos. 1 and 2, *C*....................	5.40	
Basis of exposure hazard, .70, [17]....................	3.78	
Exposure of No. 8, "CDd," "2," [52, 53,] .2.......	.75	
Deduct for diagonal exposure, ¼, [54]................	.19	
Hazard of exposure to No. 8.............................		.56
Inherent hazard of No. 13, *D*...........................	5.00	
Basis of exposure hazard, .80, [17]....................	4.00	
Exposure, "DDd," "½," [52].............................		2.40
Inherent hazard of six adjn'g frame buildings, *B*...	10.80	
Basis of exposure, .60, [17]...............................	6.48	
Exposure, "DDd," "1,".....................................		6.48
Inherent hazard of No. 5, *B*..............................	.70	
Basis of exposure hazard, .50, [17]....................	.35	
Exposure of No. 8, "ADd," "0,".........................	.5	.17
Inherent hazard of No. 4, *B*..............................	.70	
Basis of exposure hazard, .50, [17]....................	.35	
Exposure of No. 5, "ABa," "0," .2......................	.07	
Exposure of No. 8, "ADd," "0,".........................	.5	.03
Inherent hazard of No. 3, *B*..............................	.70	
Basis of exposure hazard, .50, [17]....................	.35	
Exposure of No. 4, "ABa," "0," .2......................	.07	
Exposure of No. 5, "ABa," "0," .2......................	.01	
Exposure of No. 8, the same, [41, 42,]................		.01
Total hazard of exposure to No. 2..		9.65
Inherent hazard of No. 8..		1.80
Rate on buildings Nos. 6 to 12..		11.45
Exposure hazard to stock, *b* 1 2, in No. 8, .85..................		8.20
Inherent hazard..		1.80
Rate on stock in No. 8..		10.00

55. When a brick building projects in front and rear beyond an adjacent building with "c" or "d" protections, so that the side walls of the former pro-

tect the latter, the front and rear protections of the latter may be rated as "B" in calculating the exposure hazard from such projecting building.

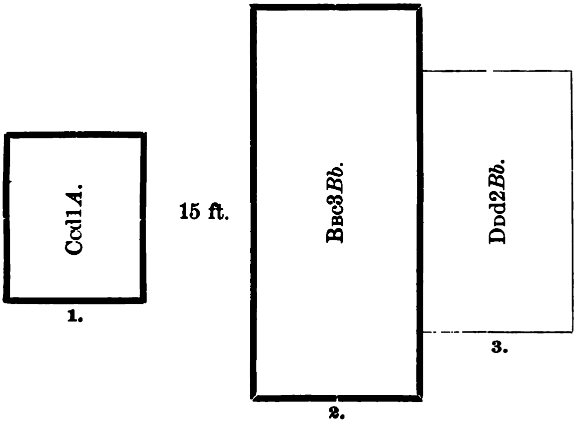
EXAMPLE XI.

FIRE DEPARTMENT THIRD CLASS.

No. 1.—Brick dwelling; openings unprotected on all sides; wooden cornice front and rear; shingle roof; one story, fifteen feet in height; occupation non-hazardous, .40.

No. 2.—Brick building; side walls entire to roof; front and rear openings unprotected; composition roof; three stories; hazardous, .80; height, thirty feet; fifteen feet east of No. 1.

No. 3.—Frame building; shingle roof; two stories; hazardous, 1.70.



To Rate No. 1.

Inherent hazard of No. 2, *B*	.80	
Basis of exposure hazard, .45, [17]	.36	
Exposure, "Cbd," [55,] "½,"	.3	.11
Inherent hazard of No. 3, *B*	1.70	
Basis of exposure hazard, .55, [17]	.93	
Exposure to No. 2, "Bbc," .3	.28	
Exposure to No. 1, "Cbd," [55,] "½,"	.3	.08
Inherent hazard of No. 1		.40
Rate on No. 1		.59

To Rate No. 3.

Inherent hazard of No. 2, *B*	.80	
Basis of exposure hazard	.36	
Exposure, "Bbd," [36, 55,]	.4	.14
Inherent hazard of No. 1, *A*	.40	
Basis of exposure hazard, .35	.14	
Exposure to No. 2, "Bbc," "1," [35,]	.0	
Inherent hazard of No. 3		1.70
Rate on No. 3		1.84

◆

INTERMEDIATE BASIS RATES.

56. When the rates of inherent hazard on two or more classes of hazards approach each other, or are nearly the same, an intermediate proportion of the inherent hazard of one or more of them may be taken for the basis rate of exposure [17]. Thus, eighty-five per cent may be taken for the basis rate of exposure from either a special or an extra hazard.

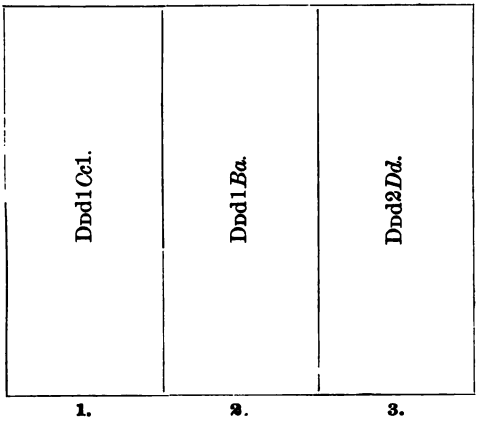
EXAMPLE XII.

NO ORGANIZED FIRE DEPARTMENT.

No. 1.—Frame building; shingle roof; one story; extra hazardous, 4.00.

No. 2.—Frame building; shingle roof; one story; hazardous, 2.00.

No. 2.—Frame building; shingle roof; two stories; special hazard, 5.00.



To Rate No. 1.

Inherent hazard of No. 2, *B*	2.00	
Basis of exposure, .70, [17]	1.40	
Exposure	.1	1.40
Inherent hazard of No. 3, *D*	6.00	
Basis of exposure, .85, [56]	5.10	
Exposure, .1 of .1	.1	5.10
Total hazard of exposure to No. 1		6.50
Inherent hazard of No. 1		4.00
Rate on building No. 1		10.50

Exposure hazard to stock, *c* 1, .90, [51,]		5.85
Inherent hazard of No. 1		4.00
Rate on stock in No. 1		9.85

To Rate No. 2.

Inherent hazard of No. 1, *C*	4.00	
Basis of exposure .80, [17]	3.20	
Exposure	.1	3.20
Inherent hazard of No. 3, *D*	6.00	
Basis of exposure, .85, [56]	5.10	
Exposure, .1 of .1	.1	5.10
Total hazard of exposure to No. 2		8.30
Inherent hazard of No. 2		2.00
Rate on building No. 2		10 30
Exposure hazard to stock, *a* 1, .70		5.81
Inherent hazard of No. 2		2.00
Rate on stock in No. 2		7.81

To Rate No. 3.

Inherent hazard of No. 2, *B*	2.00	
Basis of exposure, .70, [17]	1.40	
Exposure	.1	1 40
Inherent hazard of No. 1, *C*	4.00	
Basis of exposure, .80, [17]	3.20	
Exposure, .1 of .1	.1	3.20
Inherent hazard of No. 3, *D*		6.00
Rate on building No. 3		10.60

Rate on stock, the same as on the building [51].

EXPOSURE TO CHIMNEYS.

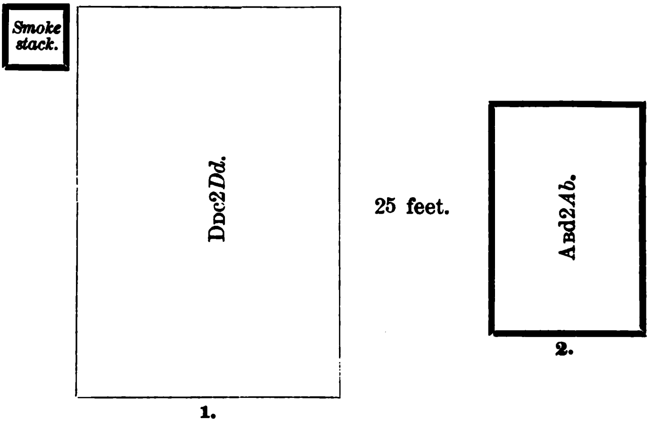
57. Buildings with shingle roofs are not only peculiarly exposed to the burning of adjacent buildings, but are alike peculiarly exposed to sparks from chimneys. The records show that "sparks on the roof" are among the most frequent causes of fires. Extraordinary hazards of this kind should be estimated separately, without considering intervening buildings or protections. For estimating the hazard from a smoke stack to an adjacent building with a shingle roof, the basis should be the extra charge for a shingle roof on the building to which the smoke stack belongs, and the calculation should be the same as for frame buildings directly exposing each other, taking the difference between the height of the smoke stack and that of the exposed building as the unit of measure [35].

EXAMPLE XIII.

NO ORGANIZED FIRE DEPARTMENT.

No. 1.—Frame building; composition roof; two stories; special hazard, 8.00. (Saw mill, burning saw-dust for fuel, without spark arrester.) Brick smoke stack, seventy-five feet in height—extra charge for shingle roof on the mill would be .50.

No. 2.—Brick building; standard side walls; front and rear windows unprotected; brick cornice; shingle roof; dwelling; non-hazardous, .50.



Height of buildings, twenty-five feet each. Unit of measure for exposure to No. 1, fifty feet [35]. Unit of measure for exposure to No. 2, twenty-five feet [35]. Unit of measure for exposure to smoke stack of No. 1, fifty feet [57]. Distance between buildings, twenty-five feet. Distance of No. 2 from smoke stack, sixty-five feet.

To Rate No. 2.

Inherent hazard of No. 1	8.00	
Basis of exposure, .90, [17]	7.20	
Exposure, "Abd," "½,"	.1	.72
Basis of exposure to smoke stack	.50	
Exposure, "Ddd," "1," [57,]	.3	.15
Inherent hazard of No. 2		.50
Rate on No. 2		1.37

LOADING FOR "DEFECTS."

58. When exposures are calculated, rates of premium should not be separately loaded with "additions" for features which do not affect the inherent hazard of buildings, and which are duly considered in estimating exposures [13]. A Mansard roof, for example, may be named as a prominent feature of this kind [29]. See Example VI.

◆

CLASSIFICATION OF BUILDINGS.

59. The classification of buildings in the following schedule and formulas, as in the preceding examples, is in accordance with the protections belonging to them [29].

60. In writing, the small capital letters should be distinguished by two lines beneath them; Italic letters by one line beneath them—thus: $\text{A}\underline{\underline{\text{a}}}\text{b4}\underline{\text{Ba}}$, for AAb4*Ba*.

BASIS RATES OF PREMIUM.

61. The following schedule of Basis Rates of Premium, showing the different combinations of the principal features of the New York schedule in the classification of buildings [5~~8~~], is calculated to save time and figures in schedule rating, especially outside of the principal cities. The rates are those of the National Board of Fire Underwriters.

BASIS RATES OF PREMIUM FOR BUILDINGS NOT EXCEEDING THREE STORIES IN HEIGHT, TWENTY FEET IN WIDTH, AND ONE HUNDRED FEET IN LENGTH.

CLASS OF BUILDINGS.	FIRE DEPARTMENT.					
	FIRST CLASS.	SECOND CLASS.	THIRD CLASS.	FOURTH CLASS.	FIFTH CLASS.	SIXTH CLASS.
AAa	.30	.40	.50	.60	.70	.80
AAb	.35	.45	.55	.65	.75	.85
AAc	.40	.50	.60	.70	.80	.90
AAd	.55	.65	.75	.85	.95	1.05
ABa	.40	.50	.60	.70	.80	.90
ABb	.45	.55	.65	.75	.85	.95
ABc	.50	.60	.70	.80	.90	1.00
ABd	.65	.75	.85	.95	1.05	1.15
ACa	.50	.60	.70	.80	.90	1.00
ACb	.55	.65	.75	.85	.95	1.05
ACc	.60	.70	.80	.90	1.00	1.10
ACd	.75	.85	.95	1.05	1.15	1.25
BAa	.40	.50	.60	.70	.80	.90
BAb	.45	.55	.65	.75	.85	.95
BAc	.50	.60	.70	.80	.90	1.00
BAd	.65	.75	.85	.95	1.05	1.15

BASIS RATES OF PREMIUM—*Continued.*

CLASS OF BUILDINGS.	FIRE DEPARTMENT.					
	FIRST CLASS.	SECOND CLASS.	THIRD CLASS.	FOURTH CLASS.	FIFTH CLASS.	SIXTH CLASS.
BBa	.50	.60	.70	.80	.90	1.00
BBb	.55	.65	.75	.85	95	1.05
BBc	.60	.70	.80	.90	1.00	1.10
BBd	.75	.85	.95	1.05	1.15	1.25
Bca	.60	.70	.80	.90	1.00	1.10
Bcb	.65	.75	.85	.95	1.05	1.15
Bcc	.70	.80	.90	1.00	1.10	1.20
Bcd	.85	.95	1.05	1.15	1.25	1.35
CAa	.50	.60	.70	.80	.90	1.00
CAb	.55	.65	.75	.85	.95	1.05
CAc	.60	.70	.80	.90	1.00	1.10
CAd	.75	.85	.95	1.05	1.15	1.25
CBa	.60	.70	.80	.90	1.00	1.10
CBb	.65	.75	.85	.95	1.05	1.15
CBc	.70	.80	.90	1.00	1.10	1.20
CBd	.85	.95	1.05	1.15	1.25	1.35
Cca	.70	.80	.90	1.00	1.10	1.20
Ccb	.75	.85	.95	1.05	1 15	1.25
Ccc	.80	.90	1.00	1.10	1.20	1.30
Ccd	.95	1.05	1.15	1.25	1.35	1.45
DAa	.70	.80	.90	1.00	1.10	1.20
DAb	.75	.85	.95	1.05	1.15	1.25
DAc	.80	.90	1.00	1.10	1.20	1.30
DAd	.95	1.00	1.10	1.20	1.30	1.40
DBa	.80	.90	1.00	1.10	1.20	1.30
DBb	.85	.95	1.05	1.15	1.25	1.35
DBc	.90	1.00	1.10	1.20	1.30	1.40
DBd	1.05	1.15	1.25	1.35	1.45	1.55
Dca	.90	1.00	1.10	1.20	1.30	1.40
Dcb	.95	1.05	1.15	1.25	1.35	1.45
Dcc	1 00	1.10	1.20	1.30	1.40	1.50
Dcd	1.15	1.25	1.35	1.45	1.55	1.65
DDa	1.25	1.35	1.45	1.55	1.65	1.75
DDb	1.30	1.40	1.50	1.60	1.70	1.80
DDc	1.35	1.45	1.55	1.65	1.75	1.85
DDd	1.50	1.60	1.70	1.80	190.	2.00

STENOGRAPHIC FORMULAS FOR DENOTING RISKS AND RATES.

62. Rates on buildings may be indicated by figures immediately following the letter which denotes the inherent hazard. Thus, referring to Example I., the rates of premium on the buildings may be indicated as follows: —

No. 1. Dᴅd4*D*,8.40.

No. 2. Dᴅd1*B*,8.30.

63. A blank between the lines, is convenient for noting changes, and also for showing intervening space. See Example II.: —

No. 1. Dᴅd2*B*,2.06.
18 ft. 2.01.
No. 2. Bʙc2*B*, 1.12.
1.16.

64. The relative distance of buildings from the street line may be indicated by brackets before the stenographs, and the distance of the buildings from the street line may be indicated in feet by figures

immediately before the bracket. Thus, referring to Example III.: —

No. 1. [Dᴅd1*B*.
30 ft.
No. 2. 15[Dᴅd2*A*,.94.
24 ft.
No. 3. 15[Dᴅd2*A*.

65. The front and rear walls of a building are not always alike, and may both be shown, as well as both side walls. The width of buildings may be indicated in feet by figures between the letters which denote the side walls; the length, by figures between the letters which denote the front and rear walls. Thus, referring to Example IV.: —

No. 1. [B20Bʙ60ʙd2*B*,1.21.

No. 2. [B20Bʙ60ʙd2*B*,1.31.

66. When each of two adjoining buildings has independent side walls, both walls may be shown in the blank line between them. See Example V.:

No. 1. [B20Bʙ60ʙc3*B*,.90.
BB.
No. 2. [B20Bc60cc3*B*,1.00.

67. The rate on the contents of a building may be inferred from the rate on the building and the class of the goods. Rates on goods may, however, be indicated in parenthesis. Thus, referring to Example IX.: —

No. 1. [D20Dᴅ50ᴅd2*B*,6.25*a*(5.50).

No. 2. [D20Dᴅ50ᴅd1*B*,6.50*b*(5.50).

No. 3. [D20Dᴅ50ᴅd1*B*,6.50*a*(5.00).

No. 4. [D20Dᴅ50ᴅD2*B*,6.50*b*(5.75).

No. 5. [D20Dᴅ50ᴅD2*B*,6.50*b*1(5.50).

68. The stenograph of a rear addition, or of an adjoining building in the rear, may immediately follow the stenograph of the front building; thus:

[D25Dᴅ18ᴅd2*A*,.75[D25Dᴅ18ᴅd1.

69. When space intervenes between front and rear buildings, the distance in feet may be indicated by figures between brackets; thus: —

[C30Cᴄ40cb2*A*,.65.]   85   [D20Dᴅ25ᴅd2*C*,1.20.

70. The relative distance of rear buildings from the rear alley may be shown by brackets after the stenographs, and the distance of the buildings from the alley may be indicated in feet by figures immediately after the brackets; thus: —

[D24Dᴅ18ᴅd2*A*,.80.]   [D20Dᴅ24ᴅd2*C*,1.50.]

[D24Dᴅ18ᴅd2*A*,.80.]   [D15Dᴅ20ᴅd1*B*,1.25.]20

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